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**In the Claim:**

1. (Currently Amended) A firetrain for ~~transmitting a detonation from its input to its output including a safe and arm device~~ having a safe position and an armed position, the firetrain comprising:

an input explosive column ~~at the input~~ having a longitudinal axis;

a transfer charge having a longitudinal axis and first and second ends and movable from the safe position to the armed position;

a receptor charge having a longitudinal axis that is non-collinear with and substantially parallel to the longitudinal axis of the input explosive column;

wherein, in the safe position, the transfer charge is remote from both the input explosive column and the receptor charge; and

wherein, in the armed position, the input explosive column is adjacent the first end of the transfer charge to thereby initiate the transfer charge, the longitudinal axis of the input explosive column is substantially perpendicular to the longitudinal axis of the transfer charge, the second end of the transfer charge is adjacent the receptor charge to thereby initiate the receptor charge at ~~the output~~ and the longitudinal axis of the receptor charge is substantially perpendicular to the longitudinal axis of the transfer charge.

2. (Currently Amended) The firetrain of claim 1 wherein the transfer charge comprises CL-20 with a binder and wherein a total volume of explosives in the transfer charge is less than about 0.0002 cubic centimeters ~~input explosive column, the transfer charge and the receptor charge is less than about 0.002 cubic centimeters.~~

3. (Currently Amended) The firetrain of claim 2 wherein a total volume of explosives in the input explosive column and the transfer charge is less than about 0.0012 cubic centimeters.

4. (Currently Amended) The firetrain of claim 2 wherein a total volume of explosives in the input explosive column is less than about 0.001 cubic centimeters.

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5. (Canceled)
6. (Currently Amended) The firetrain of claim 2 + wherein the receptor charge consists of secondary explosives.
7. (Currently Amended) The firetrain of claim 2 + wherein the input explosive column comprises first, second and third charges, the first charge initiating the second charge, the second charge initiating the third charge and the third charge initiating the transfer charge.
8. (Original) The firetrain of claim 7 wherein the first charge consists of primary explosive, the second charge consists of primary explosive and the third charge consists of secondary explosive.
9. (Currently Amended) The firetrain of claim 2 + further comprising:  
a spot charge disposed adjacent the input explosive column, for initiating the input explosive column;  
an initiator chip disposed adjacent the spot charge, for initiating the spot charge; and  
an output charge disposed adjacent the receptor charge, the receptor charge initiating the output charge at the output.
10. (Currently Amended) A safe and arm assembly having a safe position and an armed position, comprising:  
an input explosive column having a longitudinal axis;  
a transfer charge having a longitudinal axis and first and second ends and movable from the safe position to the armed position;

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a receptor charge having a longitudinal axis that is non-collinear with and substantially parallel to the longitudinal axis of the input explosive column;

wherein, in the safe position, the transfer charge is remote from both the input explosive column and the receptor charge; and

wherein, in the armed position, the input explosive column is adjacent the first end of the transfer charge to thereby initiate the transfer charge, the longitudinal axis of the input explosive column is substantially perpendicular to the longitudinal axis of the transfer charge, the second end of the transfer charge is adjacent the receptor charge to thereby initiate the receptor charge and the longitudinal axis of the receptor charge is substantially perpendicular to the longitudinal axis of the transfer charge;

the first part of claim 9;

a spot charge disposed adjacent the input explosive column, for initiating the input explosive column;

an initiator chip disposed adjacent the spot charge, for initiating the spot charge; an output charge disposed adjacent the receptor charge, the receptor charge initiating the output charge;

a base assembly having the output charge and a first portion of the receptor charge disposed therein at the output;

a safe and arm device layer disposed atop the base assembly, the safe and arm device layer including an arming mechanism movable between the safe position and the armed position, the transfer charge being disposed in the arming mechanism and a second portion of the receptor charge being disposed in the safe and arm device layer;

a cover plate assembly disposed atop the safe and arm device layer and having the input explosive column disposed therein; and

an initiator board assembly disposed atop the cover plate assembly and having the spot charge and the initiator chip disposed therein at the input.

11. (Original) The safe and arm assembly of claim 10 wherein a total volume of explosives in the input explosive column, the transfer charge and the receptor charge is less than about 0.002 cubic centimeters.

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12. (Original) The safe and arm assembly of claim 10 wherein a total volume of explosives in the input explosive column and the transfer charge is less than about 0.0012 cubic centimeters.
13. (Original) The safe and arm assembly of claim 10 wherein a total volume of explosives in the input explosive column is less than about 0.001 cubic centimeters.
14. (Original) The safe and arm assembly of claim 10 wherein the transfer charge consists of secondary explosives.
15. (Original) The safe and arm assembly of claim 10 wherein the receptor charge consists of secondary explosives.
16. (Currently Amended) The safe and arm assembly of claim 10 wherein the input explosive column ~~at the input~~ comprises first, second and third charges, the first charge initiating the second charge, the second charge initiating the third charge and the third charge initiating the transfer charge.
17. (Original) The safe and arm assembly of claim 16 wherein the first charge consists of primary explosive, the second charge consists of primary explosive and the third charge consists of secondary explosive.
18. (Canceled)
19. (Currently Amended) The safe and arm assembly ~~firetrain~~ of claim 25 ~~18~~ wherein the input charge, transfer charge and receptor charge are substantially a same size.

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20. (Currently Amended) The safe and arm assembly firetrain of claim 25-18 wherein the transfer charge consists of secondary explosives.

21. (Currently Amended) The safe and arm assembly firetrain of claim 25-18 wherein the receptor charge consists of secondary explosives.

22. (Currently Amended) The safe and arm assembly firetrain of claim 25-18 wherein the input explosive column comprises first, second and third charges, the first charge initiating the second charge, the second charge initiating the third charge and the third charge initiating the input charge.

23. (Currently Amended) The safe and arm assembly firetrain of claim 22 wherein the first charge consists of primary explosive, the second charge consists of primary explosive and the third charge consists of secondary explosive.

24. (Canceled)

25. (Currently Amended) A safe and arm assembly having a safe position and an armed position, comprising:

an input explosive column having a longitudinal axis;

an input charge having a longitudinal axis and first and second ends, the input explosive column being substantially perpendicular to and adjacent the first end of the input charge;

a transfer charge having a longitudinal axis and first and second ends and movable from the safe position to the armed position;

a receptor charge having a longitudinal axis that is substantially collinear with the longitudinal axis of the input charge;

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where n, in the safe position, the transfer charge is remote from both the input charge and the receptor charge; and

where n, in the armed position, the second end of the input charge is adjacent the first end of the transfer charge to thereby initiate the transfer charge, the longitudinal axis of the input charge is substantially collinear with the longitudinal axis of the transfer charge, the second end of the transfer charge is adjacent the receptor charge to thereby initiate the receptor charge and the longitudinal axis of the receptor charge is substantially collinear with the longitudinal axis of the transfer charge;

the first part of claim 24;

a spot charge disposed adjacent the input explosive column, for initiating the input explosive column;

an initiator chip disposed adjacent the spot charge, for initiating the spot charge; an

output charge disposed adjacent the receptor charge, the receptor charge initiating the output charge at the output;

a base assembly;

a safe and arm device layer disposed atop the base assembly, the safe and arm device layer including an arming mechanism movable between the safe position and the armed position, the transfer charge being disposed in the arming mechanism and the input charge and receptor charge being disposed in the safe and arm device layer;

a cover plate assembly disposed atop the safe and arm device layer and having the input explosive column disposed therein; and

an initiator board assembly disposed atop the cover plate assembly and having the spot charge and the initiator chip disposed therein.

26. (Canceled)

27. (Canceled)

28. (Canceled)



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29. (Canceled)

30. (Currently Amended) The safe and arm assembly firetrain of claim 35 29 wherein the transfer charge consists of secondary explosives.

31. (Currently Amended) The safe and arm assembly firetrain of claim 35 29 wherein the receptor charge consists of secondary explosives.

32. (Currently Amended) The safe and arm assembly firetrain of claim 35 29 wherein the input explosive row comprises first, second and third charges, the first charge initiating the second charge, the second charge initiating the third charge and the third charge initiating the transfer charge.

33. (Currently Amended) The safe and arm assembly firetrain of claim 32 wherein the first charge consists of primary explosive, the second charge consists of primary explosive and the third charge consists of secondary explosive.

34. (Canceled)

35. (Currently Amended) A safe and arm assembly having a safe position and an armed position, comprising:

an input explosive row having a longitudinal axis;

a transfer charge having a longitudinal axis and first and second ends and movable from the safe position to the armed position;

a receptor charge having a longitudinal axis that is substantially collinear with the longitudinal axis of the input explosive row;

wherein, in the safe position, the transfer charge is remote from both the input explosive row and the receptor charge; and

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where n, in the armed position, the input explosive row is adjacent the first end of the transfer charge to thereby initiate the transfer charge, the longitudinal axis of the input explosive row is substantially collinear with the longitudinal axis of the transfer charge, the second end of the transfer charge is adjacent the receptor charge to thereby initiate the receptor charge and the longitudinal axis of the transfer charge is substantially collinear with the longitudinal axis of the receptor charge;

the first train of claim 34;

a spot charge disposed adjacent and perpendicular to the input explosive row, for initiating the input explosive row;

an initiator chip disposed adjacent the spot charge, for initiating the spot charge; an

output charge disposed adjacent the receptor charge, the receptor charge initiating the output charge;

an output housing that contains the output charge; and

a safe and arm device layer disposed in the output housing, the safe and arm device layer including an arming mechanism movable between the safe position and the armed position, the transfer charge being disposed in the arming mechanism, the input explosive row and the receptor charge being disposed in the safe and arm device layer; and an initiator board assembly disposed atop the safe and arm device layer and having the spot charge and the initiator chip disposed therein.